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23. GEOLOGICAL FACTORS AFFECTING PROPOSED BUILDING AT COSGROVE PARK, LAUNCESTON

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INTRODUCTION

It is proposed to erect an eight storey building at Cosgrove Park, Launceston. The building site and surrounding were examined on 24th July, 1962, to assess the geological factors affecting the foundations and the stability of the site generally.

The site of the proposed building lies on the northern slopes of the "Sandhill" and is underlain by relatively soft Tertiary clays, sands and gravels. Landslips in similar material may be inspected along the Westbury Road a few chains NW of the building site.

The proposal therefore envisages the erection of a major building on relatively soft foundation material on a sloping hillside within 13 chains of known landslips. Clearly the project must be approached with some caution and a thorough investigation of the site conditions is required.

GEOLOGY

The general geology of an area surrounding the proposed building is shown on the accompanying map (Figure 26). The building site is underlain by a least 200 feet of Tertiary sediment which overlap a buried major fault trending roughly NNW through Paton and Baldwins property and crossing the Westbury Road a few chains east of its junction with the Bass Highway. West of this fault extensive dolerite outcrops occur and the Tertiary sedi-

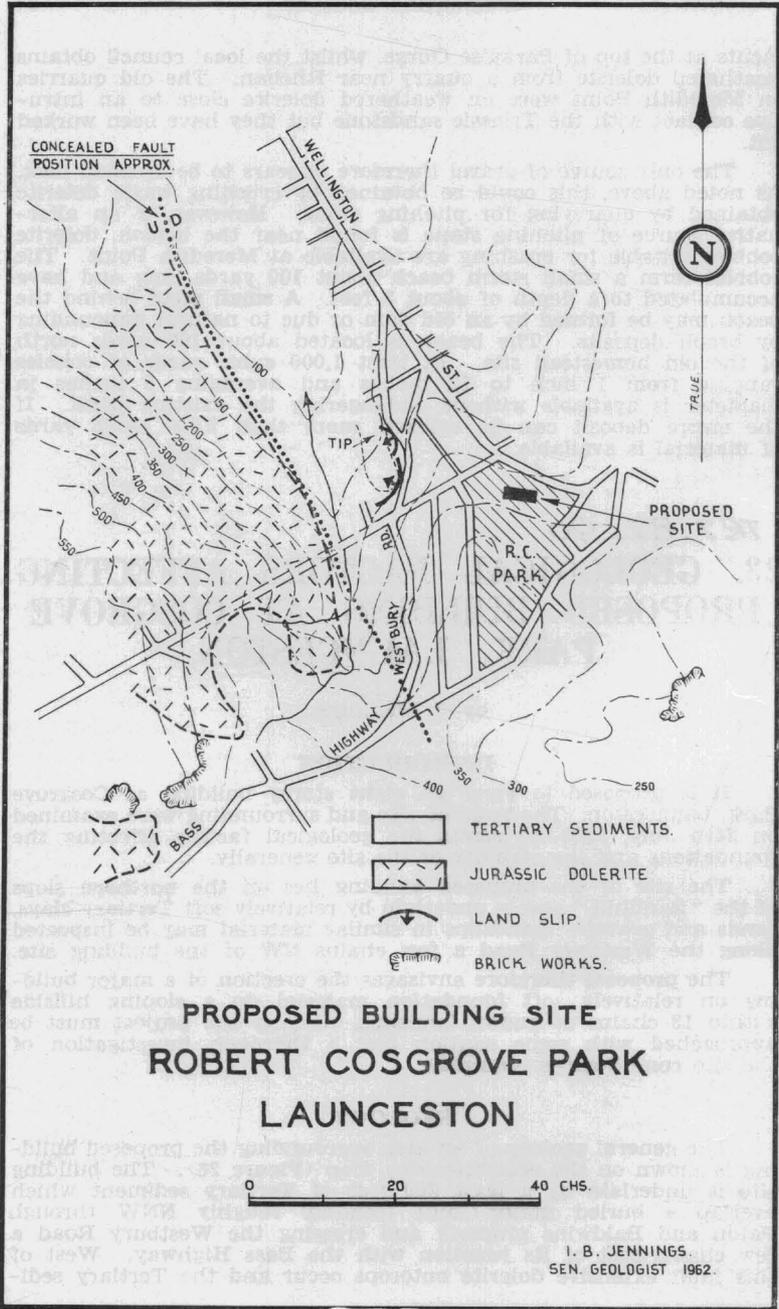
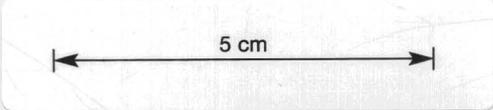


FIGURE 26.



ments are much thinner. The fault will have no practical bearing on the proposed building except that the Tertiary sediments will be much thicker to the east of it and therefore no hardrock foundations can be expected within economic limits.

The Tertiary sediments in this area consist of a thick sequence of clay, sand and gravel with occasional lignite bands; plant impressions and woody fragments occur widely throughout the sequence. Good exposures of these sediments may be inspected at the several clay and gravel pits in the area but no useful outcrops are available at the proposed building site. An examination of these pits revealed that the sand and gravel beds frequently occur as discontinuous lenses or irregular beds. Dips in the sequence, though generally low (less than 10°) are quite variable. Steeper dips in cuttings west of the caravan park are probably related to the nearby fault and therefore essentially local and unlikely to be present at the proposed building site. However, it is clear that extensive investigation may be necessary at the site to determine the dips accurately due to these relatively small scale irregularities.

ENGINEERING FEATURES

Two main problems involved in the proposal are:—

- (1) The bearing capacity of the Tertiary sediments; and
- (2) The stability of the site with respect to landslips.

Until some excavations are made at the building site it is only possible to offer general remarks concerning the bearing capacity of the foundation materials. The surface indications suggest that the site is underlain by some 30-40 feet of clay which may contain thin beds and lenses of sand and gravel. The bearing capacity of the clay can be expected to be similar to that encountered at the site of the new Queen Victoria Hospital. Special precautions will be necessary to spread the load over as great an area as possible and thus reduce the unit load. Any concessions which can be made toward decreasing the overall height of the building and increasing the foundation area will tend to lessen this problem.

The question of landslips is much more difficult. It must be recognized that landslips which may ultimately affect the stability of the structure can be initiated by works which may be made in the future outside the control of this building authority. Major slips have occurred in the past along the Westbury Road and although the remedial measures which have been taken appear to have arrested them for the time being, it would be unwise to assume that this ground is now permanently stable.

Two main factors contribute to the formation of landslips. These are the inclination of the beds and the presence of water-logged sand and gravel beds within the sequence. It will, therefore, be necessary to ensure that the dip of the clay beds is not unfavourable and to test the site thoroughly for the presence of permeable horizons which could lubricate the enclosing clay layers. The following investigations are designed to provide information on these aspects as well as supplying undisturbed samples for determination of the shear strength of the material.

RECOMMENDATIONS

Until information is available as to the relative level of the foundation of the proposed building it is impossible to give precise estimates of the depth to which the proposed test pits must be taken.

Diamond Drilling

Three holes, approximately 100 feet deep, should be drilled at the points indicated on the enclosed plan. The drilling should be carried out by a plant capable of taking undisturbed samples in relatively unconsolidated material to about 50 feet and to supply good core recovery over the remaining 50 feet.

Test Pits and Excavations

Four test pits should be put in at the positions indicated on the enclosed plan. The depth of the pits will be determined by the depth of the proposed foundation excavations but unless this is excessive they should be carried 3 feet below the proposed foundations. If the inclination of the beds as revealed by these pits is extremely irregular it may become necessary to excavate a system of shallow trenches in addition to the test pits. This can be determined at a later stage in the investigations.